# OPEN LETTERS.

## That "probably carnivorous" Polyporus.

I am much obliged to Mr. Cook for his helpful criticism in the March GAZETTE of my note in the November number. The points that he makes strike me as generally well taken and it was because of my recognition of their force that I entitled my note a "*probable* new category of carnivorous plants." I intended to make plain to all readers that my interpretation of the facts was a purely tentative one. I am not yet sure, however, that *Polyporus applanatus* does not digest the unfortunate flies. I distinctly stated that the production of new pores was *not* while the fly was in "high relief" upon the surface, but after the fly was *thoroughly digested.* In this case the "surface area" was not larger than before though the pores were more numerous and somewhat smaller than upon a similar area where no fly had been captured. Thus Mr. Cook's objection, and his principal objection, seems to be scarcely to the point. To be sure I speak of the flies "raising the hymenial level," but since this is a tabular not a rounded excrescence there is really no increase in poriferous surface. The statement was, however, not sufficiently clear and I readily see how it led Mr. Cook astray. I take pleasure in amending it. And again, it occurs to me that the illustration given by Mr. Cook of the way in which the Polyporus hymenophores "grow around" small twigs, etc., is hardly applicable to this case. It is not the general growth that encloses the fly but a renewed putting forth of hyphæ from the interior of the pores, apparently under the stimulation of the fly's presence. This struck me at the time and still appears to me to be noteworthy.

The little flies that I examined really did "lie flat upon the surface of the hymenophore." Perhaps this was due to prolonged tetanic contractions of the interesting muscles in their legs. But I leave that to Mr. Cook.—CONWAY MACMILLAN, *University of Minnesota.*

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# NOTES AND NEWS.

MR. J. G. BAKER is publishing in the *Gardeners' Chronicle* a synopsis of the species of *Canna.*

MR. A. A. HELLER has published a preliminary list of the lichens of Lancaster county, Penn.

A SPECIMEN of Cereus senilis ("old man cactus") which has been in cultivation in England for about sixty years has grown only about three inches in all that period.

THE PROTECTION of plants against snails has been studied by L. Piccioli, who finds that such substances as tannic acid, latex, essential oils, raphides, etc., furnish the chief protection.

DURING THE coming season Mr. Charles W. Armstrong, of Toronto, intends to go thoroughly into the flora of York county, Canada. He will collect sets of plants for specialists in any group above bryophytes.

THE AMERICAN literature of compass plants is cited and commented upon in the January number of the *Deutsche botanische Monatsschrift* by J. Christian Bay of the Missouri Botanic Garden. Seventeen articles are mentioned.

MR. F. L. SARGENT advocates in *The Household* the claims of the Columbine to be the national flower. He finds in it the Phrygian liberty cap, the five-pointed star, the cornucopia, the thirteen original states, and the red-white-and-blue!

A NEW FORM of plant press is figured and described in Queen's *Microscopical Bulletin* for February. It is made of wood, held together with straps, and has elastic bands to keep the unused papers in place. It weighs but 22 ounces without papers, and will doubtless prove a popular press for field work.

DR. KARL PRANTL, professor of botany and director of the botanic garden of the University of Breslau, died in that city on the 24th of February. Dr. Prantl is also well known as an author of many valuable works; as the editor of *Hedwigia*; and as the joint editor, with Engler, of *Die natürlichen Pflanzenfamilien.*

IN *Proc. Philad. Acad.* for 1892 (pp. 357-365) is the beginning of another botanical series by Professor E. L. Greene, under the title "Eclogae Botanicae." Under the name of *Carduus* a number of new western thistles are described, and the old ones transferred. Three new lupines are also described, one from Colorado, the other two from California.

NOLL DESCRIBES[1] two lecture experiments, one showing the visual influence of the coloring matter of Florideæ; another showing a heliotropic experiment with the sporangia of Pilobolus crystallinus placed in the Sachs heliotropic camera[2] or a modification of this instrument. Both of the experiments are suited to catch the student's attention.—BAY.

THE QUESTION of the root-tubercles of Leguminosae bids fair to become still more complicated. B. Frank and H. Moeller are engaged in a discussion concerning an announcement by the former that Pisum sativum has two kinds of tubercles, differing in position, size and content; a thing which the latter claims is simply due to difference in age.

OBSERVATIONS on root tubercles upon both indigenous and introduced plants of the northwest, made by Prof. H. L. Bolley (Agricultural Science, VII, 58) indicates that such tubercles are common upon all native species of the order, as well as upon introduced species. But the latter were often without tubercles when growing upon virgin soil, especially when not more than one season old.

MR. THOMAS HOWELL, in *Erythea* (Feb.), has suggested a rearrangement of American *Portulaceæ*. It has chiefly to do with the delimitation of Claytonia, Montia, and Calandrinia. A new genus, *Oreobroma*, is proposed, "named in allusion to the edible fleshy roots," and contain-

[1] Flora LXXVII, pp. 27-37.

[2] Vorlesungen, 1887, p. 737.

ing species taken out of Calandrinia, Lewisia, and Claytonia, to the number of ten. Professor Greene had already previously transferred species of other Claytonia to Montia.

WHILE DETMER (on the nature and importance of the physiological units in the plant)[1] is broadening out the plasome-theory of Wiesner, assuming that the life is closely connected with the "living albumen-molecule"[2], we find Crato[3] adding a contribution to the theory of Bütschli, assuming the applicability of the comb structure in the protoplasm. Detmer's paper is a very valuable contribution to the physiological theory of cell-structure.—BAY.

PROFESSOR J. VON SACHS has finished the publication of his collected works on vegetable physiology, which collection, however, does not comprise all of his papers, but only the most important of his many contributions. The two stout volumes will, of course, be one of the things that the botanical student has to read. Notes under the text show the renowned investigator's altered views on many subjects, many of these notes being very illustrative. The plates accompanying many of the papers have been replaced by figures in the text.—BAY.

A NEW anthracnose of privet (Ligustrum vulgare) is described and figured by Geo. F. Atkinson in a recent bulletin of the Cornell station (No. 49). It attacks the twigs forming brown, depressed spots, which sooner or later extend around the stem and cut off the supply of sap to the portion above, thus killing the twig. Pure cultures on nutrient agar-agar were studied. The fungus proves to be a new species, and is described under the name of Gloeosporium cingulatum, being closely related to G. fructigenum, which causes the ripe rot of apples.

THE International Standing Committee on nomenclature, appointed at the Genoa congress is as follows: *Germany*, Ascherson, Engler, Radlkofer; *France*, Baillon, Bureau, Malinvaud; *England*, Baker, Clarke, Hooker; *Russia*, Batalin, Schmalhausen; *Switzerland*, De-Candolle; *Italy*, Caruel, Saccardo; *Austria*, Celakovsky, Kanitz, Kerner, Willkomm; *Belgium*, Crépin, Durand; *Sweden*, Fries, Wittrock; *Portugal*, Henriques; *Spain*, Lara; *Denmark*, Lange; *Netherlands*, Suringar; *Australia*, Von Mueller; *United States*, Britton, Coulter, Greene.

BY TREATING SPECIMENS of Spirogyra from which the starch had been entirely removed with substances which readily break up into simpler constituents, of which formic aldehyde is one, Herr T. Bokorny showed that these plants have the power of separating formic aldehyde from the nutrient solution, and then converting it into starch. This appears to furnish argument in favor of the view that formic aldehyde is the substance first formed in the production of carbohydrates from the carbon dioxide of the atmosphere.—*Jour. Roy. Micr. Soc.*, Feb.

NUMBERS 76—79 of Engler and Prantl's *Die natürlichen Pflanzenfamilien* have just been distributed. No. 76 contains a continuation of the

[1] Berichte d. deutschen bot. Gesellschaft, x, 441 (1893).
[2] See Pflüger, in his Archiv f. d. ges. Physiologie, x.
[3] Berichte d. deutschen bot. Gesells. x. 451.

first volume, and presents Myxogasteres, Fungi, and Chytridineae, by J. Schröter. No. 77 contains another installment of the Leguminosae, by P. Taubert; No. 78 contains the Cyrillaceae, by E. Gilg, the Aquifoliaceae, by M. Kronfeld, and the Celastraceae, by Th. Lösener; No. 79 contains the Chenopodiaceae, by G. Volkens. In all these parts the same splendid typography and engraving continues. The American genera of the groups above mentioned stand very much as our monographers have left them.

By a series of experiments extending at intervals over three years made with the intermittent klinostat (a klinostat so modified as to make a partial rotation at regular intervals, remaining stationary in the mean time) Professor Francis Darwin and Miss Pertz have shown that rhythmic curvatures in plants may be artificially induced by exposing shoots to alternate and opposite stimuli of a geotropic or heliotropic nature. When a plant had come to be in a thoroughly rhythmic state they found it possible to prophesy to a minnte at what time the reversal of curvature would take place. These experiments are of great interest in their bearing on periodic movements.

Dr. Karl Gœbel calls attention in *Annals of Botany*, vi. 355, and also in *Flora*, to the location of the sexual organs in Buxbaumia, in which the single antheridium is borne on the protonema itself, with only the formation of a single involucral leaf, so that alone this structure would pass for an alga; while the archegonia are borne on a very rudimentary stem with several involucral leaves. Thus Buxbaumia comes very near to the theoretical idea of the simplest moss, which looks upon the protonema as the primitive oophyte, and conceives the leafy stem to be a specialized archegoniophore which gradually came into prominence as an advantageous host of the sporophyte.

M. Ph. van Tieghem, in *Journal de Botanique* (March 1) discusses the classification of Basidiomycetes. He recognizes nine co-ordinate families in the group, as follows: Lycoperdaceae, Agaricaceae, Tilletieae, Tremelleae, Tylostomeae, Ecchyneae, Auricularieae, Pucciniaceae, and Ustilageae. The first family contains five tribes, the second nine, the eighth ten, and all the rest are represented by a single tribe. The Lycoperdaceae contain Gastromycetes of authors, excepting Tylostomeae and Ecchyneae, which are raised to family rank. The Agaricaceae contain the Hymenomycetes of authors, and also the Dacryomycetes usually included under the Tremelleae.

Mr. Thomas Morong has some interesting notes on Orchids in the *Bulletin of the Torrey Botanical Club* (February). A new species of Listera from Hudson Bay Territory is described; attention is called to the fact that many orchids are capable of self-fertilization; and certain necessary changes in nomenclature are pointed out. According to our recent agreement in reference to date, *Calopogon* R. Br. should be replaced by *Cathea* Salisb.; *Spiranthes* Richard by *Gyrostachys* Persoon; *Goodyera* R. Br. by *Peramium* Salisb.; and *Myrosmodes* Nutt. by *Achroanthes* Raf. In a note in the March number, however, he corrects his change of Colopogon to Cathea and says that *Linnaeodorum* is entitled to use.

AMONG RECENT bulletins from the Experiment Stations containing botanical matters are the following: "Oat smut" by L. R. Jones (Vt., No. 6); "Can peach rot be controlled by spraying?" by F. D. Chester (Del., No. 19); Common fungous diseases and their treatment" by W. C. Sturgis (Conn., No. 115); "Preventive treatment for apple scab, downy mildew and brown rot of the grape, potato blight and the smut of wheat and oats" by E. S. Goff (Wis., No. 34); "Black rot of the grape" by R. H. Price (Texas, No. 23). Bulletin No. 49 of the Cornell Station upon "Sundry investigations of the year" contains a short article on "Golden rod weeds" by A. N. Prentiss, two fungous diseases are described by G. F. Atkinson, and L. H. Bailey writes about a new maize and some egg-plant crosses.

THERE ARE TWO stations in Italy for the economic investigation of plant diseases,as we learn from an article by L. Paperelli,in the *Experiment Station Record* (iv, 233). One is the royal Station and Laboratory of Cryptogamic Botany at Pavia, established in 1871 in connection with the Botanical Institute of the Royal University. The director is Prof. G. Briosi, who has a special assistant for the station work. The income is about $2,000. The laboratory is also used for students in connection with the University. The other is the Royal Station of Vegetable Pathology at Rome, established in 1887. The director is Prof. G. Cuboni, who has two assistants. The income in 1891-'92 was $2,600. They are required to investigate the nature and cause of diseases, test and provide remedies, and disseminate information by lectures and publications.

TWO PAPERS on carnation diseases were read before the American Carnation Society at its annual session in Pittsburg during the last week in February, both of which are printed with many illustrations in the *American Florist* for Feb. 23d. One was by Prof. Geo. F. Atkinson, of Cornell University, who treated of rust (Uromyces caryophyllinus),spot (Septoria Dianthi), anthracnose. (Volutella sp.), rosette (Fusarium sp.?), and fairy ring spot (Heterosporium echinulatum). The development of the fungi producing these diseases is very fully described, including the behavior of part of them in gelatine culture. Illustrations are also given of a Cladosporium and a Botrytis which injure carnations. The other paper was by Prof. B. D. Halsted, of Rutgers College, describing spot, anthracnose, leaf mold (Cladosporium sp.), and a bacterial disease. A considerable part of the paper was devoted to remedies and means of controlling the several diseases.

THE PROCEEDINGS of the American Association for the Advancement of Science for the meeting at Rochester, August, 1892, has lately been distributed. It is a volume of 380 pages mostly devoted to the addresses of the officers, reports of committees, and abstracts of papers read. There are twenty-four botanical papers, represented by abstracts of about half a page each, and fifteen titles without even abstracts. There are several biological articles of as much interest to botanists as to those to whom they were especially addressed. Of these may be mentioned *Heredity of acquired characters*, by Manly Miles; *Comparative physiology of respiration*, by Simon H. Gage, and *Micro-organisms of the soil*, by Alfred Springer, the two latter being vice-presidential

addresses. The address of the retiring president, Albert B. Prescott upon *The immediate work in chemical science* is filled with important suggestions and almost as applicable to botany as to chemistry.

In a long paper in the March number of the *Annals of Botany* Dr. D. H. Scott and Mr. George Brebner discuss the secondary tissues of three genera of the shrubby monocots, namely, *Yucca*, *Dracæna*, and *Aristea*. They first reinvestigated the vexed question regarding the mode of origin and growth of the tracheides of Yucca and Dracæna. This question is mainly concerned with the point as to whether these secondary tracheides arise from the growth of a single cell, which consequently would have to push its way between other already formed cells much as the hypha of a fungus might, or whether the tracheides are formed by the fusion of several cells standing end to end. These investigators fully agree with the researches of Krabbe and Rösler, concluding that "the tracheides are formed by longitudinal growth only, each tracheide arising from a single cell, which may grow to thirty to forty times its original length, but remains uninucleate throughout its whole development." Further: "As the secondary tracheides are formed in a region which has ceased to grow in length, their development is entirely by sliding growth. . . . There can be no doubt that the development of the tracheides in the primary bundles is similar, but as the latter are formed in a region which is still lengthening as a whole a proportionately smaller amount of sliding growth is involved.

The studies of these gentlemen on the structure of *Aristea corymbosa*, one of the four known shrubby members of the great order Iridæ, have established the fact that this species "in common no doubt with the few other shrubby species of Irideæ, forms an indefinite amount of secondary tissue by means of cambium which continues active during the whole life of the plant. The tissue formed centrifugally, on the inner side of the cambium, consists of secondary concentric bundles, imbedded in ground tissue; on the outer side of the cambium a large amount of secondary cortex is formed. The latter is wholly parenchymatous." The authors point out that there is a remarkable agreement between the three groups of monocots in which secondary thickening occurs, and they hold that this peculiarity has arisen independently in each of the three. They add: "It is very probable that the first origin of secondary growth may be taking place in some of the monocotyledons at the present day, just as we find medullary bundles appearing in certain dicotyledons as an individual peculiarity."